Abstract

Studies about the physiological and biochemical postharvest behaviour of fennel and kohlrabi are very scarce in the scientific literature. For that reason, it has been considered interesting to study the postharvest changes of kohlrabi and fennel (whole and minimally processed) under cold storage and controlled atmosphere (CA) and modified atmosphere packaging (MAP).

Quality changes during cold storage and shelf life were characterised by analysing physical parameters, chemical parameters, microbiological analysis, and sensory. Physiological disorders and bacterial and fungal decay were also evaluated. Fennel bulbs placed in air at 0°C showed a moderate respiratory activity (10-12 mg CO2 kg -1 h -1) and a low C2 H4 emission (0.2-0.5 μL kg -1 h -1) with a non-climacteric pattern. At 0°C bulbs did not show any physiological damage under CA with low O2 (5 kPa) and moderate to high CO2 (5-15 kPa), retarding the development of browning on the butt end cut. Related to the whole bulbs, fresh processing increased the CO2 and C2 H4 production. Low O2 and high CO2 delayed the browning on the cut zone improving visual appearance.

A low metabolic activity with a non-climacteric pattern and non-significant chemical composition changes were detected in kohlrabi stems under storage at 0 or 5°C and high RH. Stems showed a respiration rates at 0°C of 7 to 10 mg CO_2 kg^{-1} h^{-1} and a C_2H_4 emission of 5 to 10 nL kg^{-1} h^{-1}. Very low C_2H_4 concentrations in air (below 0.05 μL L^{-1}) caused the loss of green colour, yellowish and petiole abscission. MAP was very effective for keeping overall quality of the stems and to retard wilting of the leaves.

Fresh-cut kohlrabi showed a respiratory activity and C_2H_4 emission at 0°C 2 to 8 fold higher than that detected for stems. Throughout storage at 0°C these rates tended to be similar. The dehydration of the cut surfaces at 5°C was the main problem affecting their quality, bring about a drastic reduction of the shelf life of fresh cut kohlrabi, and the use of MAP to overcome this trouble was not efficient.